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RADICALLY REDUCING THE COSTS OF PANEL CRITICAL REVIEWS ACCORDING TO ISO 14040

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ABSTRACT

We suggest a procedure that radically reduces the critical review costs without compromising their thoroughness and overall quality. This procedure has 3 elements: A fixed panel for all reviews, an already critically reviewed background database, and a software-supported review procedure. The presentation discusses these elements in the light of the upcoming ISO 14071 on critical review.

INTRODUCTION TO THE PROBLEM: COSTS AND QUALITY

Critical reviews were adopted as a requirement for LCAs according to ISO 14040 in its first 1996 edition (ISO 1996). The first detailed guideline for critical review of LCA was published by Weidema (1997).

Since then, much experience has been gained with critical reviews in practice, but there is a growing concern about the costs of the reviews. Due to the large variety of data sources and algorithms used by LCA practitioners, a thorough review may sometimes come close to repeating the entire study, and the costs for serious critical reviews are often seen to amount to a substantial part of the overall study budget. This is especially true for panel reviews, which the ISO 14044 standard requires for comparative assertions. This is amplified by the still unfinished debate on whether labelling is to be regarded as a comparative assertion (since it is used to support comparative decisions).

The concern for costs is mirrored by a concern for the quality of the reviews. To keep costs down, it is sometimes practiced to limit the reviews, e.g. to the summary report, thereby by excluding important data sources and algorithms from the review. Such limitations of the reviews are not in the spirit of ISO 14044 and seriously damage the credibility of the review procedure.

SUGGESTION FOR A SOLUTION WITH THREE ELEMENTS

A procedure is required that reduces the costs of critical reviews without compromising their thoroughness and overall quality. This is especially important for organisations that perform a large number of LCAs, such as companies with many products, LCA database developers, and organisations working with environmental labelling or product declarations.

We suggest a procedure with three elements that radically reduces the critical review costs. The three elements of this procedure are the use of:

- a fixed panel for all reviews for the same organisation,
- an already critically reviewed background database, and
- a software-supported review procedure.

THE USE OF A FIXED PANEL

For organisations that perform a large number of LCAs, an important part of the costs of the review procedure is expended for the administrative effort of composing, communicating with, and remunerating the review panels.

One way to reduce this administrative effort, without compromising the quality of the reviews, is to set up a fixed panel with a standardised procedure for the organisation of the review work. By pre-selecting a larger number of independent LCA-experienced domain and topic experts as panel members, and having a fixed procedure for appointing the panel chair, the relevant experts can be involved for each specific review, fulfilling the ISO 14044 requirement of at least 3 panel members in each review, without having to design and implement a specific administrative procedure for each review. It is important that the fixed panel include both LCA expertise and topic expertise for all the technical areas that can become relevant for the LCAs handled by the organisation. A particular concern is the requirement for involvement of “interested parties”, since a very inclusive interpretation of this requirement could make the review procedure exceedingly costly. However, the ISO 14040 standard recognizes that budget limitations may determine the size of a panel, and does not require the involvement of specific interested parties. For the credibility of the procedure, the most important issue is the independence and relevant expertise of the reviewers, so that these can take into account the concerns of all relevant interested parties.

THE USE OF AN ALREADY REVIEWED BACKGROUND DATABASE

The second – and most important element – of our procedure is based on the 1:1 relationship between the number of LCAs and the number of unit processes in an LCI database (because the product system for each LCI is composed of the one unit process in which the functional unit is defined and all its upstream and downstream activities). This relationship implies that every time you create a new unit process, you also create a new LCA (for the reference product of that unit process).

The starting point for our procedure is a complete global database where no cut-offs are applied, and where specified algorithms (LCI models) are used for calculating the LCA results. Imagine now that critical reviews have already been performed for each single unit process, essentially ensuring that the unit processes reflect the reality they are intended to reflect. Imagine also that each of the algorithms that the database use for linking the unit processes in to product systems and for calculating the LCA results from the have been critically reviewed, essentially ensuring that the algorithms provide the results they are expected to. This would imply that each single LCA result from this database is already critically reviewed.

When using such a fully critically reviewed database as background database for a new LCA study, it would only be necessary to review the new “foreground” datasets or algorithms that you add for the decision context in which it is used. If this critically reviewed “foreground” dataset is then added to the already existing database of activity datasets, it becomes part of the fully critically reviewed background database and its already existing implicitly critically reviewed LCAs.

By limiting the critical review to the newly added data and algorithms, the costs are obviously radically reduced, without reducing the overall quality of the review. In fact, by ensuring that every single dataset is critically reviewed, the overall quality of the review will be enhanced compared to the present-day situation, where typically only a small sample of the applied data are reviewed – if data are reviewed at all.

THE USE OF A SOFTWARE-SUPPORTED REVIEW PROCEDURE

The third element of our procedure is to perform the reviews purely electronically, as for journal article submission systems. This reduces travel costs, meeting time, and administrative efforts, while ensuring that all comments and communications are documented and stored. Standardised forms may be used to make reviews easier to perform and to make it easier to assemble the documentation into a review report.

IMPLEMENTATION OF THE PROCEDURE

Our proposed procedure can be implemented by large companies with their own background database, and by organisations operating an EPD and other labelling scheme that requires an LCA for each product labelled. It is also being implemented in the ecoinvent database, where a review panel has been established with the database administrator as independent chair, and where all reviews are already performed and documented electronically. The last and most important step of ensuring the completeness of the database and that each and every dataset of the database has been critically reviewed by at least 3 experts is still not finalised and is expected to take some years before it is achieved.

RELATION TO THE UPCOMING ISO 14071

The International Standards Organization is currently developing a technical specification on critical review processes and reviewer competencies to complement the recommendations and requirements of ISO 14044 (ISO 2006). At the time of writing, this technical specification (ISO TS 14071) is still only a working draft, but we may nevertheless consider how our suggested procedure will relate to its expected requirements.

For a standardised review of all the LCAs that are included in a background database of an organisation - be it a company, labelling organisation or dedicated database development organisation like ecoinvent - there will obviously be a lot of documentation which is identical for all the reviews made, such as the statements in the Critical Review statement of the identity of the panel chair and that the review is:

- performed based on paragraph 6.3 of ISO 14044,



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- performed at the end of the study,
- based on a previously reviewed database context and LCI model,
- a review of a specified individual dataset or set of algorithms,
- finding the study to be compliant with ISO 14044.

Such documentation, therefore, can be prepared as a general statement and can become part of every review without the need for rewording.

Compared to the current procedure at ecoinvent, the current draft of ISO TS 14071 includes a requirement for an extra round of approval of the Final Critical Review Statement by all reviewers, even when the statement is just a summary of all the comments made earlier. This will unfortunately mean an unnecessary additional delay and cost increase for the review.

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